



NU DASMARIÑAS

GESTS01X – Science, Technology and Society

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Week 5B - Technology, Invention, Innovation

Introduction to Technology, Invention and Innovation

- What is Science?
- What is Technology?
- What is Invention?
- What is Innovation?



What is Science?

- Science can be thought of as both a body of knowledge (the things we have already discovered), and the process of acquiring new knowledge (through observation and experimentation—testing and hypothesising).



What is Technology?

- Is the **body of knowledge devoted to creating tools, processing actions** and the **extracting of materials**.
- It is an **application of science** used to solve problems.
- we use technology to **accomplish or simplify** various tasks in our daily lives.

Origin: From the Greek words “**techne**” (“science of craft”) and “**logia**” (“skill of hand”).





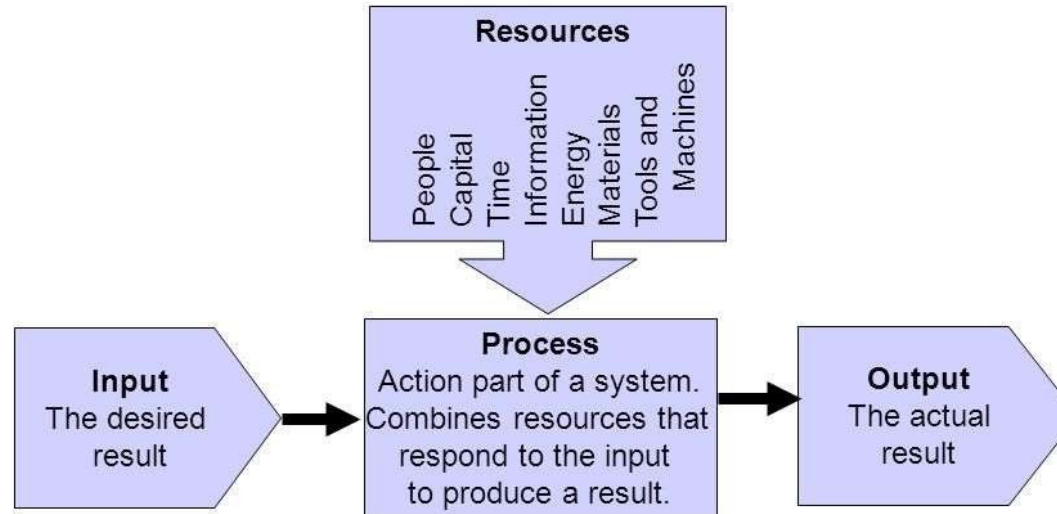
Technological Systems

- Systems (e. g. machines) applying technology by taking an **input**, changing it according to the system's use (**process**), and then producing an **output**.

Examples of Technological System

1. Solar panels
2. Your personal computer
3. Manufacturing machines

The Basic System Model



- All systems include an *Input*, *Process*, and *Output*
- During the *Process* the seven technological *Resources* are used.



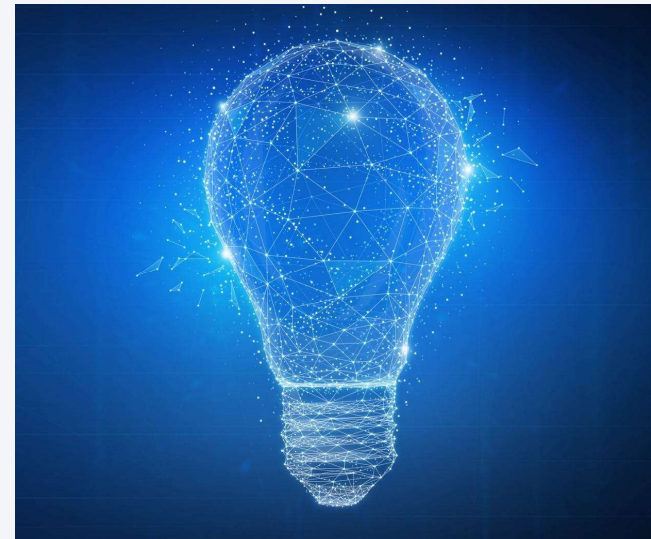
What is an Invention?

- A new product or system, or process that has never existed before, created by study and experimentation.



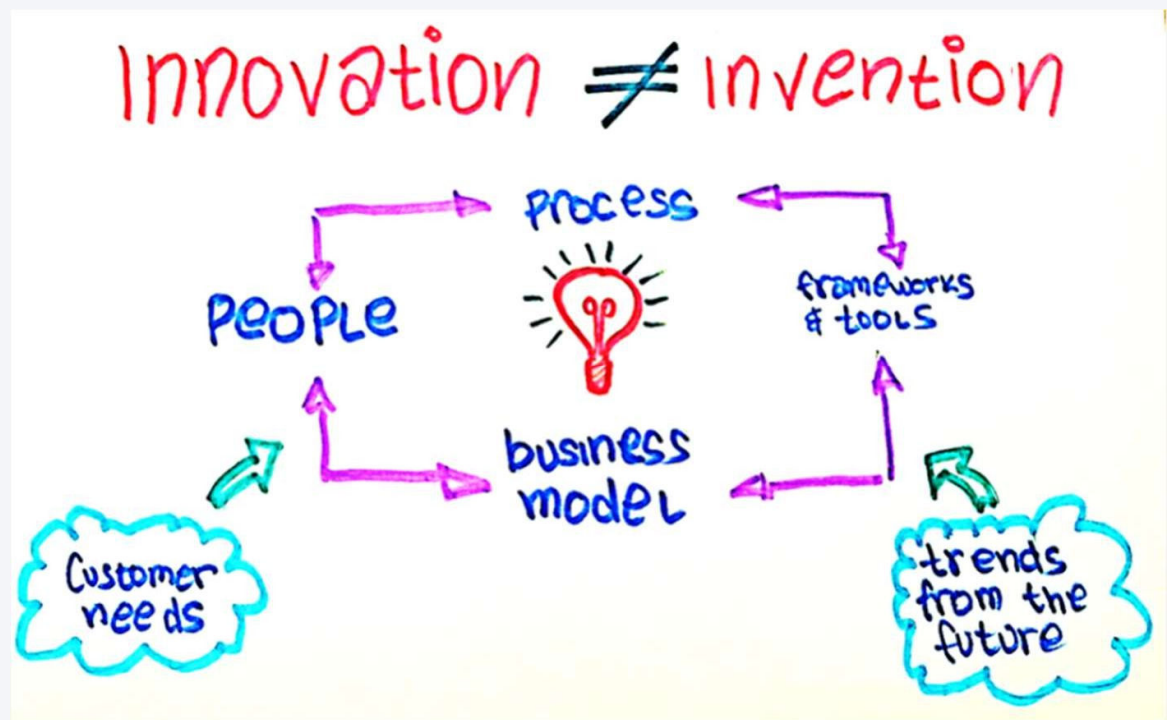
What is Innovation?

- Is a process by which a domain, a product, or a service is renewed and brought up to date by applying new processes, introducing new techniques, or establishing successful ideas to create new value.



Invention vs. Innovation

- Invention is the creation of new product
- Innovation is an improvement of an existing product



BASIS FOR COMPARISON	INVENTION	INNOVATION
Meaning	Invention refers to the occurrence of an idea for a product or process that has never been made before.	Innovation implies the implementation of idea for product or process for the very first time.
What is it?	Creation of a new product.	Adding value to something already existing.
Concept	An original idea and its working in theory.	Practical implementation of new idea.
Skills required	Scientific skills	Set of marketing, technical and strategic skills.
Occurs when	New idea strikes a scientist.	A need is felt for a product or improvement in existing product.



Inventions that shaped the world

1. **Wheel, 3500BC** - This primitive technology made it easier for all of us to travel.
2. **Plastic, 1869** – Invented by John Wesley Hyatt. Hyatt combined cellulose nitrate and camphor to produce a mouldable versatile material – celluloid.
3. **Internet, 1990** - Tim Berners Lee wrote software for the World Wide Web (WWW) in 1990. This helped to revolutionize the internet and make it freely available to the world.

Inventions that shaped the world

4. **Refrigerator, 1927** - Before its conception, people cooled their food with ice and snow. James Harrison built the first practical vapor compression refrigeration system.
5. **Television, 1884** – A small box with enormous information that changed entertainment and communications forever.
6. **Mobile Phone, 1973** - John F. Mitchell and Martin Cooper of Motorola demonstrated the first handheld device in 1973.



Innovations that disrupted the economy

- 1. Paper currency** - money took the form of precious metals, coins and even raw materials like livestock or vegetables. paper currency was the vital first step in a new monetary system that led to the birth of credit cards and electronic banking.
- 2. Voice assistants** - In four years, the majority of American households are expected to own a voice assistant devices. Thanks to the power of artificial intelligence (AI), voice assistants will grow increasingly helpful.



Innovations that disrupted the economy

3. **Driverless Vehicles** - Automakers like Tesla, General Motors and Volvo have already developed semi-autonomous vehicles.
4. **Cryptocurrency** - a digital asset designed to work as a medium of exchange that uses strong cryptography to secure financial transactions, control the creation of additional units, and verify the transfer of assets.

Ex. 1 Bitcoin = 12659.80 USD



Notable Inventors and their Inventions

1. Leonardo da Vinci – made the first real studies of flight (1480s)
2. Alexander Graham Bell – telephone (1870s)
3. Levi Strauss – blue jeans (1873)
4. Thomas Edison – lightbulb (1879)
5. Gottlieb Daimler – invented a gas engine (1885)
6. George Eastman – photographic film (1888)

Notable Inventors and their Inventions

7. Marie Curie – together with her husband, she discovered two new elements—radium and polonium (1890s)
8. Ole Evinrude – outboard boat motor (1907)
9. George Washington Carver – industrial applications for agricultural products (1910s)
10. Henry Ford – assembly line (1913)
11. Garrett Morgan – traffic light (1923)
12. Philo T. Farnsworth – electronic television (1927)
13. Buckminster Fuller – geodesic dome (1950)
14. Nolan Bushnell – video game (1971)
15. Steve Wozniak – personal computer (1976)



Notable Inventors and their Inventions

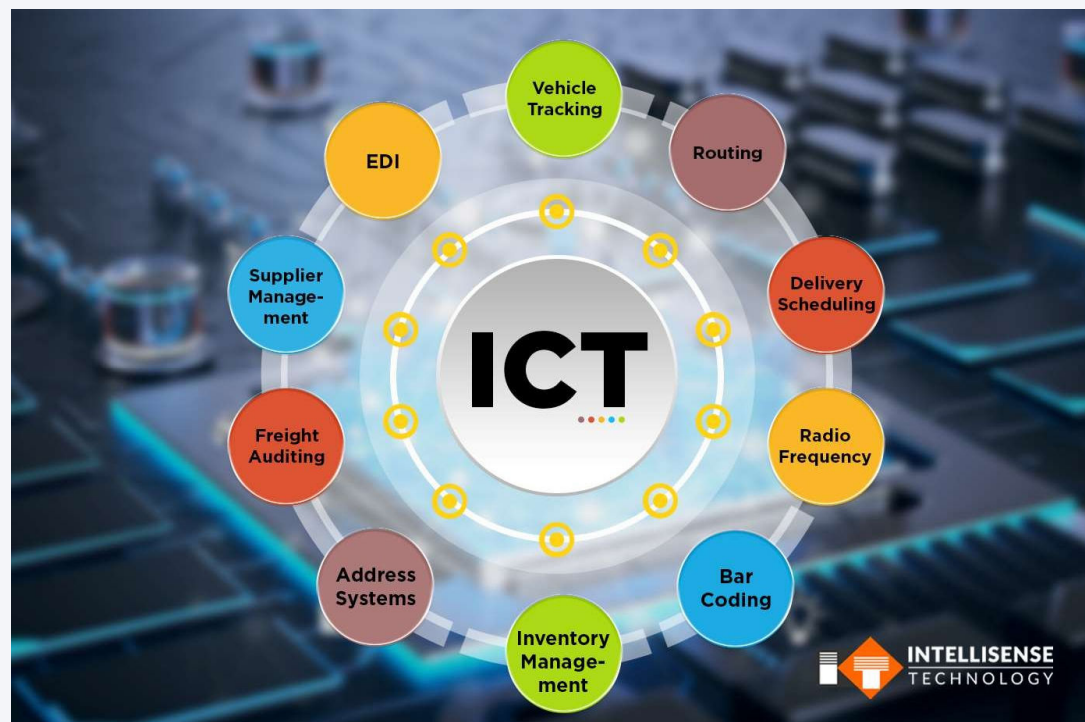
- 13. Buckminster Fuller – geodesic dome (1950)
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Discovery, Invention and Innovation **Today**

Influential Factors on Discovery, Invention and Innovation:

- Communication Technology
- Specialization of Knowledge and Teamwork
- The Rise of Organized Science
- The Influence of Government

Communication Technology



Specialization of Knowledge and Team work

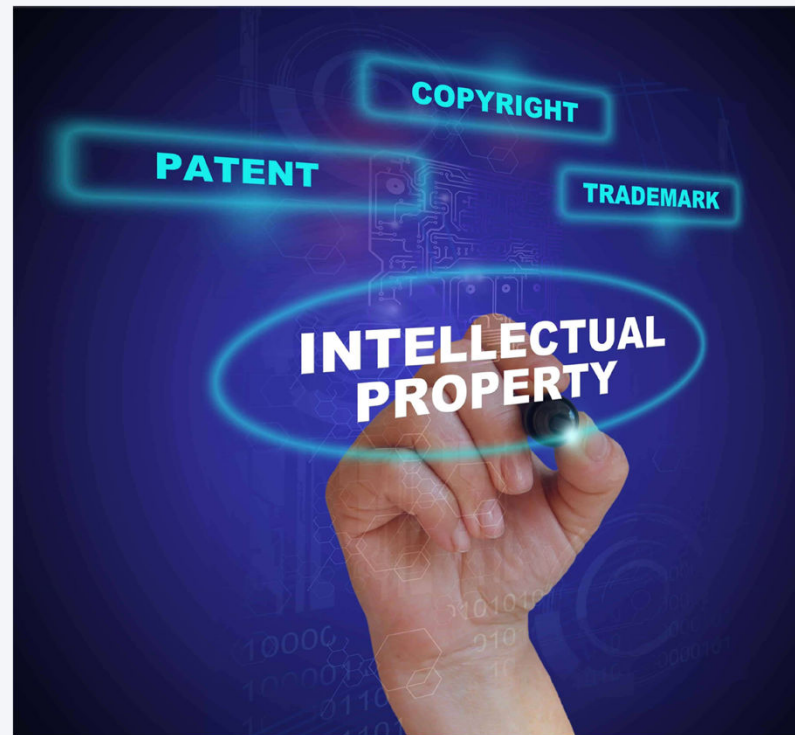


The Rise of Organized Science



The Influence of Government

- Intellectual Property
- Trademarks
- Copyrights
- Patents
- Design Patents





Activities and Exercises

COURSE PROJECT IDEATION

- Create group
- Identify group leader
- Propose an idea



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